

# FORT WILLIAM

## water pollution control plant

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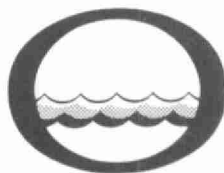
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*Water management in Ontario*

Ontario  
Water Resources  
Commission

135 St. Clair Ave. W.  
Toronto 7  
Ontario


We are pleased to present you with the Operating Summary for the water pollution control facilities operated for you during 1968.

Both the financial and technical information presented should be of assistance to your present and future planning in this important phase of municipal activity.

A new format has been devised to allow greater readability with equally detailed content. We trust that this will meet with your approval.

Our staff wish to express their appreciation for your co-operation throughout the year.

  
D. S. Caverly,  
General Manager.

  
D. A. McTavish, P. Eng.,  
Director,  
Division of Plant Operations.

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**FORT WILLIAM**  
**water pollution control plant**

operated for

THE CITY OF FORT WILLIAM

by the

ONTARIO WATER RESOURCES COMMISSION

**1968 ANNUAL OPERATING SUMMARY**

## FOREWORD

● This operating summary outlines the project's technical capabilities and financial status in 1968. Such information mirrors past and present performance, but a major intention is to anticipate the future -- to solve problems before they occur.

The new format in which this year's data are presented is designed to offer a higher level of readability than in the past, without a corresponding decrease in compactness, accuracy and detail.

Although your Regional Operations Engineer carries the major responsibility for the contents of the report, those involved in its preparation are attached to several Commission sections and divisions. The statistics section of the Division of Plant Operations compiled the information for the graphs and charts. The draughting section of the Division of Sanitary Engineering drew the graphs. The Division of Finance provided all cost data.

Only the close co-operation of these departments allowed the publication of this summary.

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## **'68 REVIEW**

During 1968, 2,093 million gallons of raw sewage were treated. This was an increase of 45 percent over 1967. The average flow very nearly approached plant capacity and exceeded hydraulic plant capacity 40 percent of the time.

The cost of treatment was \$79,442.39 or \$37.90 per million gallons, a unit cost reduction of 17 percent. This reduction is mainly due to the large increase in flow.

In 1967 the Kam interceptor sewer was added, and greatly increased flows. Average spring and early summer flows exceeded 5 mgd.

A reserve fund expenditure was used to prepare a report on the adequacy of the Brunswick sewage pumping station and its associated drainage system.

The Fort William Water Pollution Control Plant is operated by a chief operator and a staff of six permanent employees plus one casual operator.

The plant is supervised 16 hours per day, seven days per week.

Plant personnel also operate the Brunswick sewage pumping station.



## PROJECT COSTS

### 2-0050-60 (Interceptor Sewer)

NET CAPITAL COST (Final)	\$1,336,345.25
DEDUCT - Portion Financed by CMHC-MDLB (Final)	<u>855,626.69</u>
Long Term Debt to OWRC	\$ <u>480,718.56</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1968	\$ <u>67,485.68</u>
Net Operating	\$ 1,099.30
Debt Retirement	9,701.00
Reserve	7,456.33
Interest Charged	<u>26,989.18</u>
TOTAL	\$ <u>45,245.81</u>

### RESERVE ACCOUNT

Balance at January 1, 1968	\$ 52,951.99
Deposited by Municipality	7,456.33
Interest Earned	3,299.89
	<u>          </u>
	\$ 63,708.21
Less Expenditures	<u>          </u>
Balance at December 31, 1968	\$ <u>63,708.21</u>

2-0091-61 (Water Pollution Control Plant)

NET CAPITAL COST (Final)	\$2,589,550.83
DEDUCT - Portion Financed by CMHC-MDLB (Final)	<u>1,722,029.58</u>
Long Term Debt to OWRC	\$ <u>867,521.25</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1968	\$ <u>77,961.68</u>
Net Operating	\$ 79,442.39
Debt Retirement	17,428.00
Reserve	14,272.60
Interest Charged	<u>48,570.09</u>
TOTAL	\$ <u>159,713.08</u>

RESERVE ACCOUNT

Balance at January 1, 1968	\$ 36,334.86
Deposited by Municipality	14,272.60
Interest Earned	2,433.84
	<hr/>
	\$ 53,041.30
Less Expenditures	<u>2,433.84</u>
Balance at December 31, 1968	\$ <u>50,610.94</u>

2-0173-64 (Brunswick Ave. Sewage Pumping Station)

NET CAPITAL COST (Final)	
Long Term Debt to OWRC	<u>\$28,502.68</u>

Debt Retirement Balance at Credit	
(Sinking Fund) December 31, 1968	\$ <u>2,155.56</u>

Net Operating	\$ -
Debt Retirement	575.00
Reserve	171.01
Interest Charged	<u>1,197.23</u>
TOTAL	\$ <u>1,943.24</u>

RESERVE ACCOUNT

Balance at January 1, 1968	\$ 481.66
Deposited by Municipality	171.01
Interest Earned	32.40
	<u>          </u>
	\$ 685.07
Less Expenditures	<u>          </u>
Balance at December 31, 1968	\$ <u>685.07</u>

2-0175-64 (Kam Interceptor Sewer)

NET CAPITAL COST (Estimated)	\$835,832.42
DEDUCT - Portion Financed by CMHC-(Estimated)	<u>581,864.23</u>
Long Term Debt to OWRC	<u>\$253,968.19</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1968	\$ <u>10,516.10</u>
Net Operating	\$ (3,470.63) cr.
Debt Retirement	5,188.00
Reserve	4,119.89
Interest Charged	<u>12,651.15</u>
TOTAL	\$ <u>18,488.41</u>

RESERVE ACCOUNT

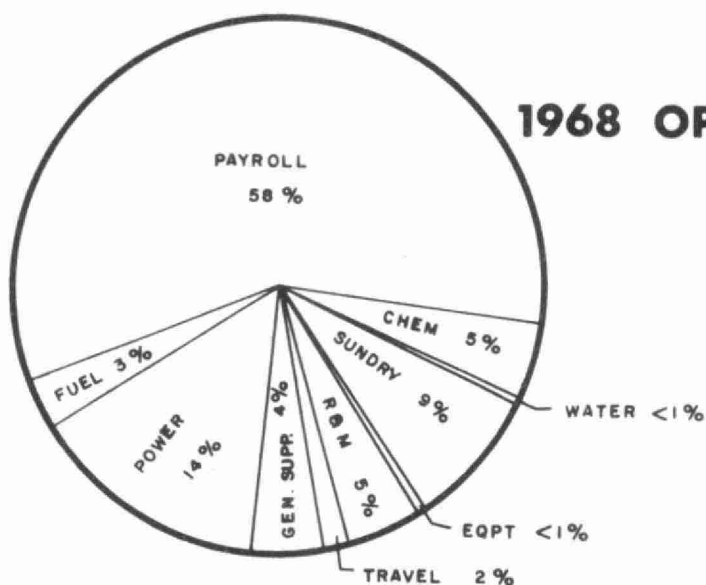
Balance at January 1, 1968	\$ 3,168.11
Deposited by Municipality	4,119.89
Interest Earned	<u>282.90</u>
	\$ 7,570.90
Less Expenditures	<u>-</u>
Balance at December 31, 1968	\$ <u>7,570.90</u>

## Monthly Operating Costs

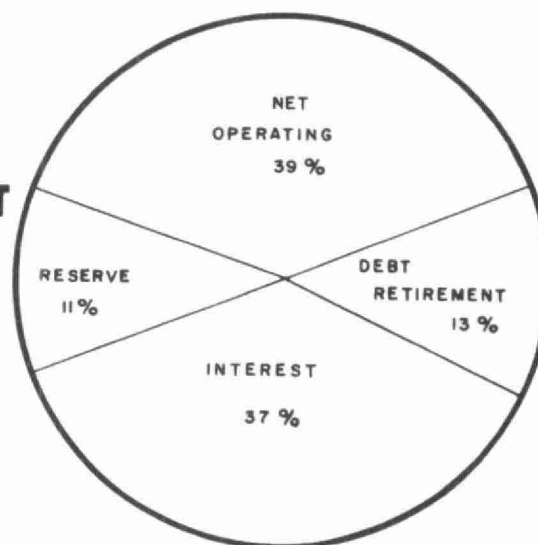
MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAY ROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	* SUNDRY	WATER	TRAVEL
JAN	4026.21	3133.87	-	193.76	159.03	-	44.58	-	95.40	399.57	-	-
FEB	5268.17	3067.38	-	280.46	815.51	-	386.27	149.55	64.67	240.13	-	64.20
MAR	6332.28	4935.73	-	298.87	145.86	-	196.77	-	278.17	400.53	-	76.35
APRIL	6043.67	3212.25	-	280.03	1632.94	-	177.82	-	224.02	362.06	78.20	76.35
MAY	7088.84	3133.11	-	286.42	901.15	1993.95	297.72	-	30.95	387.94	-	57.60
JUNE	5055.38	3154.76	-	171.73	1039.61	-	290.67	52.50	262.86	-	-	83.25
JULY	4829.83	3104.63	-	32.22	1036.01	-	148.00	-	-	218.09	72.53	218.35
AUG	7722.74	678.56	-	96.00	-	1639.05	177.30	19.77	241.35	744.41	-	126.30
SEPT	5571.61	3785.11	-	96.00	1422.39	-	135.26	-	50.85	-	-	82.00
OCT	7402.03	3309.59	-	192.00	1924.58	-	281.09	-	699.24	995.53	-	-
NOV	8441.43	3355.43	-	104.33	1322.13	-	202.44	63.54	1048.59	2110.68	70.29	164.00
DEC	11660.20	7334.93	-	310.21	1024.47	5.60	967.74	94.10	723.50	949.78	-	249.87
TOTAL	79442.39	46205.35	-	2342.03	11423.68	3638.60	3505.66	379.46	3719.60	6808.72	221.02	1198.27

\* SUNDRY INCLUDES SLUDGE HAULING COSTS WHICH WERE \$3,672.90

## 1968 OPERATING COSTS



## TOTAL ANNUAL COST



## Yearly Operating Costs

YEAR	M.G.TREATED	TOTAL COST	COST PER MILLION GALLONS	COST PER LB OF BOD REMOVED
1965	676.38	\$53,523.57	\$79.13	23 cents
1966	995.52	53,980.73	54.22	16 cents
1967	1441.77	65,894.52	45.70	14 cents
1968	2093.0	79,442.39	37.96	11 cents

## **Process Data**

The Fort William plant is a primary sewage treatment plant. It features an aerated grit chamber, primary settling tanks and two-stage digestion.

The average daily flow for the year was 5.70 mgd.

Plant capacity is 6.0 mgd, and was exceeded 40 percent of the time.

Plant effluent was chlorinated from May to November at an average dosage of 2.3 mg/l.

An average of 347 cubic yards of liquid sludge was hauled every month.

## PLANT FLOWS and CHLORINATION

MONTH	TOTAL FLOW mg	AVERAGE DAILY FLOW mg	MAXIMUM DAILY FLOW mg	MINIMUM DAILY FLOW mg	CHLORINE USED 10 <sup>3</sup> lbs.	DOSAGE mg/l
JAN	91.6	2.96	3.36	2.45	0	-
FEB	84.7	2.92	3.41	2.73	0	-
MAR	134.8	4.35	9.34	2.75	0	-
APR	133.9	4.46	8.71	3.22	0	-
MAY	188.6	6.08	10.87	4.14	3.12	3.2
JUN	226.8	7.56	11.67	5.55	6.18	2.7
JUL	254.2	8.20	15.94	5.60	6.60	2.6
AUG	230.7	7.44	12.64	4.70	5.51	2.4
SEPT	228.6	7.62	10.17	5.16	4.69	2.1
OCT	229.7	7.41	14.05	5.30	4.91	2.1
NOV	165.6	5.52	7.04	3.94	.69	1.3
DEC	123.7	3.99	5.33	3.46	0	-
TOTAL	2093.0	-	-	-	31.70	-
AVERAGE	-	5.70	-	-	5.28	2.3

### COMMENTS

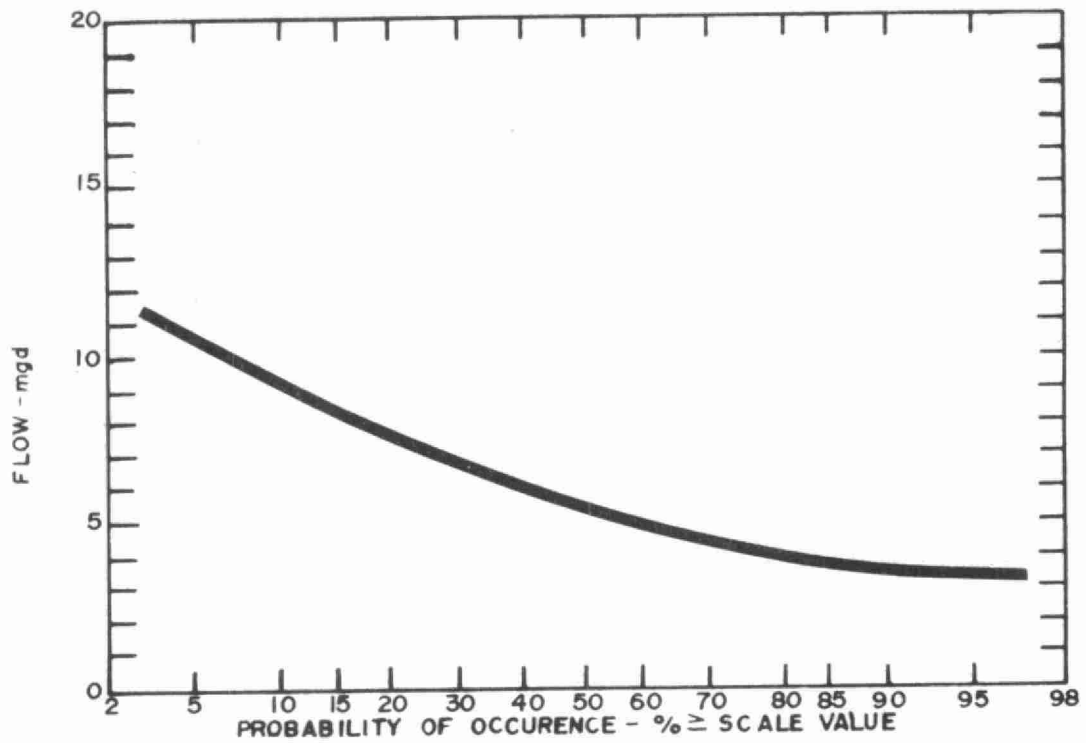
The average monthly and daily flows were 174.42 million gallons and 5.7 mgd respectively.

The maximum daily flow was almost three times average flow (15.94) and frequently exceeded 10 mgd.

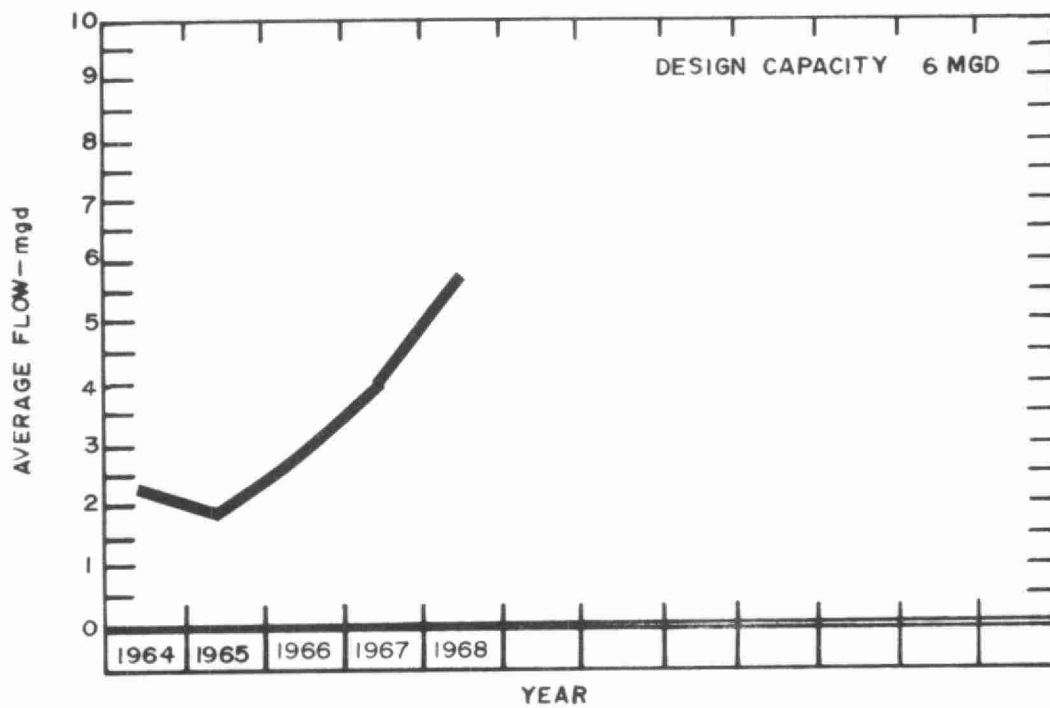
The average monthly consumption of chlorine was 5280 lbs. at an average dosage of 2.3 mg/l.

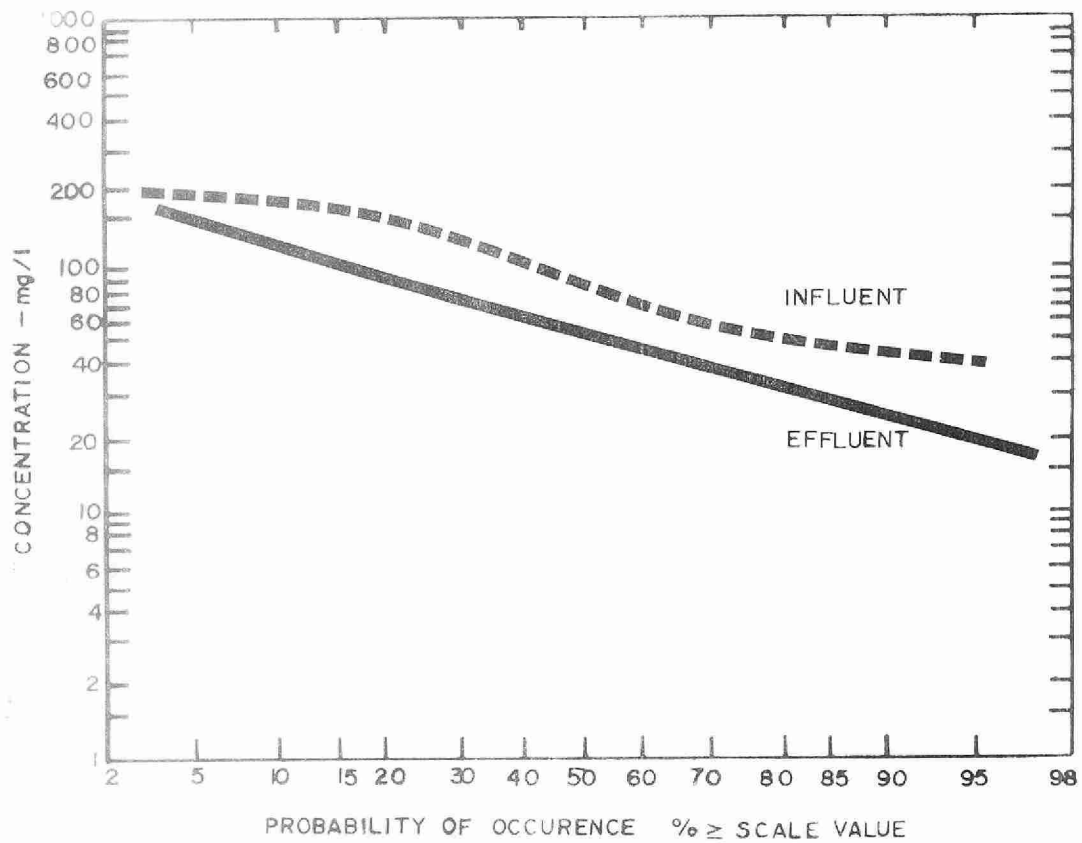
An effluent residual of 0.51 mgd/l was maintained from May till November.



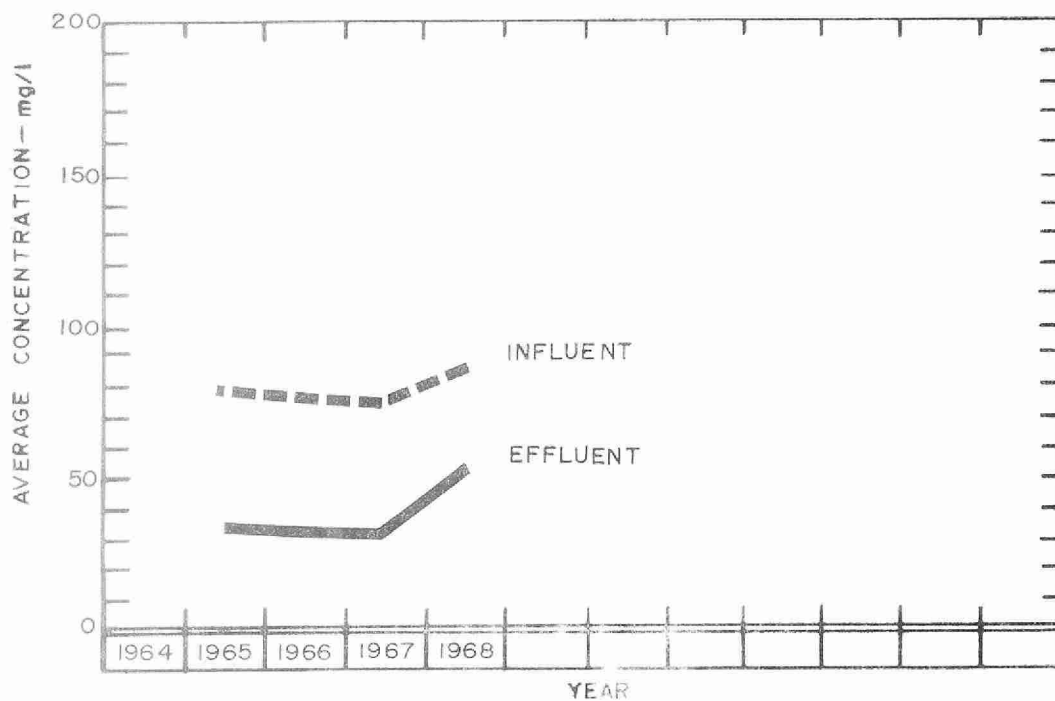


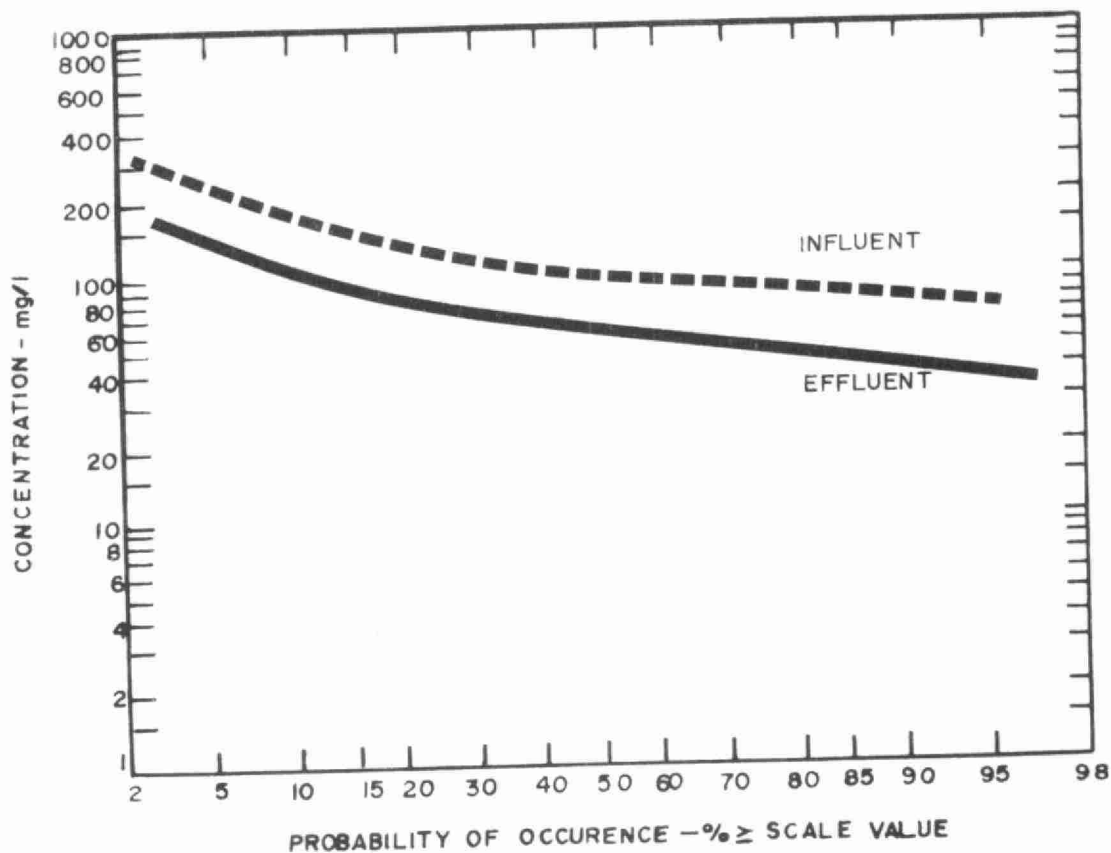
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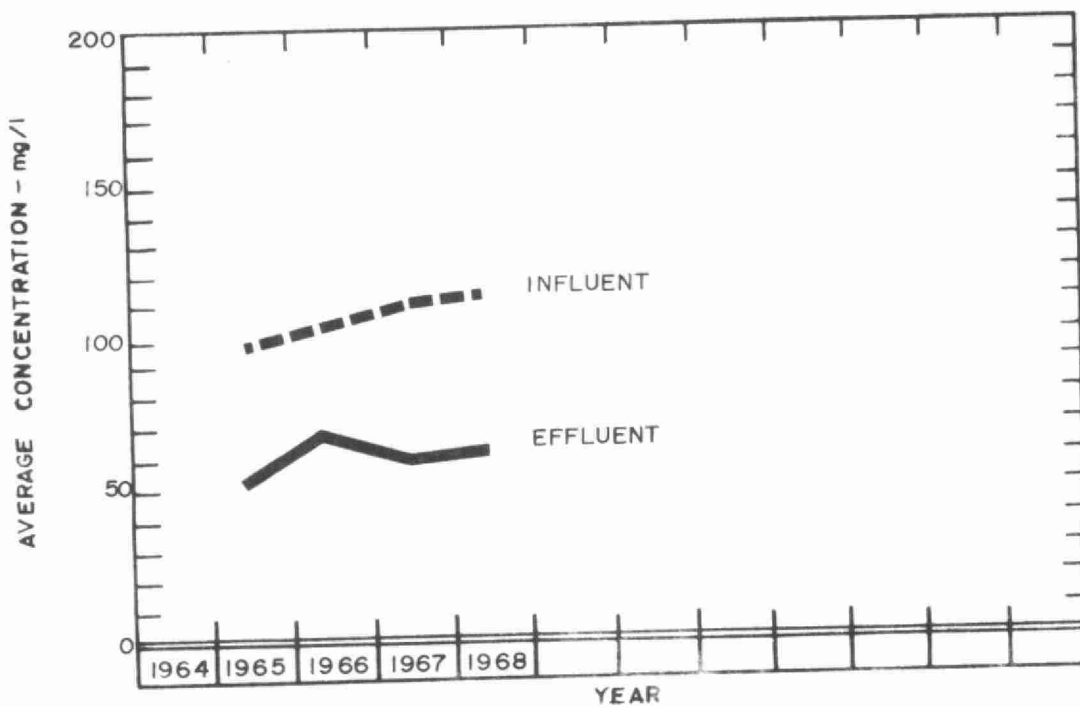


## BIOCHEMICAL OXYGEN DEMAND





## SUSPENDED SOLIDS



# PLANT EFFICIENCY

MONTH	BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				GRIT
	INF	EFF	RED <sup>N</sup>	REMOVAL	INF	EFF	RED <sup>N</sup>	REMOVAL	REMOVAL
	CONC <sup>N</sup> mg/l	CONC <sup>N</sup> mg/l	%	10 <sup>3</sup> lb	CONC <sup>N</sup> mg/l	CONC <sup>N</sup> mg/l	%	10 <sup>3</sup> lb	
JAN	70	41	41	26.6	106	54	49	47.6	294
FEB	121	40	67	68.6	95	41	57	45.7	336
MAR	82	54	34	37.7	78	51	35	36.4	476
APR	75	29	61	61.6	173	94	46	105.8	378
MAY	50	40	20	18.9	98	59	40	73.5	406
JUN	28	27	41	2.3	153	82	47	161.1	336
JULY	73	27	63	116.9	128	64	50	162.7	504
AUG	87	71	18	36.9	90	57	37	76.1	483
SEPT	88	49	44	89.2	133	69	48	146.3	336
OCT	106	59	44	108.0	91	52	43	89.6	392
NOV	85	63	26	36.4	102	61	40	67.9	252
DEC	150	107	29	53.2	98	58	41	49.5	168
TOTAL	-	-	-	656.3	-	-	-	1062.2	4361
AVERAGE	85	51	40	54.6	112	62	45	88.5	363

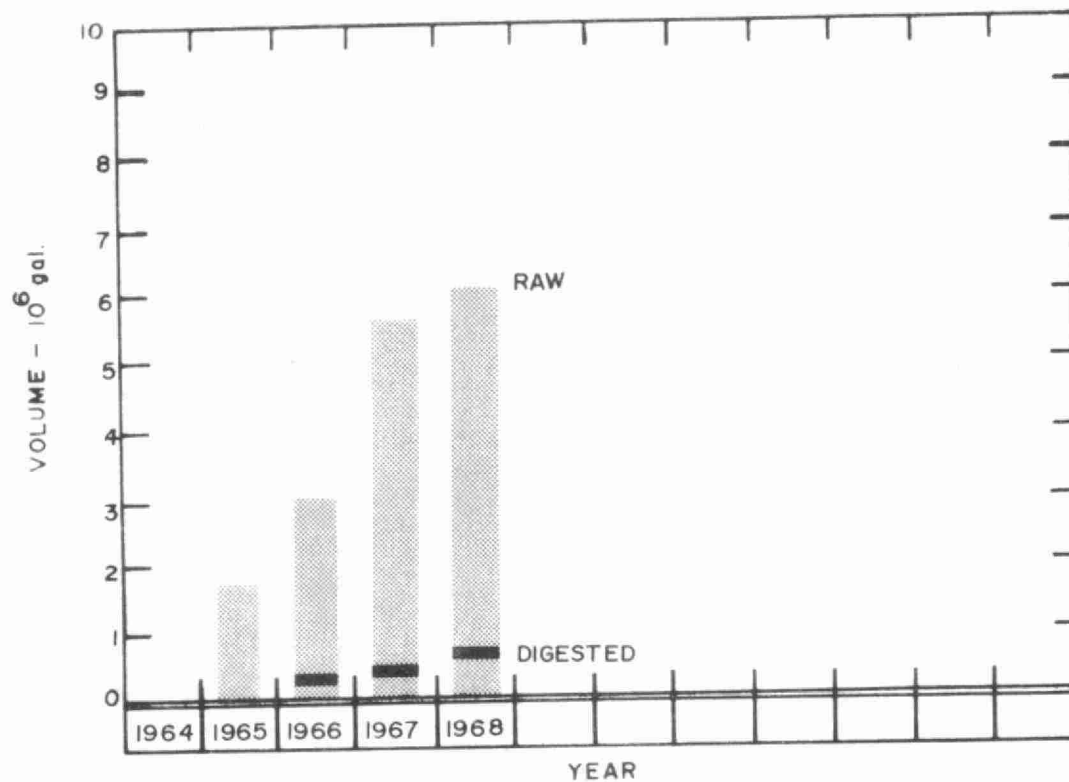
## COMMENTS

The average influent BOD and suspended solids concentrations were 85 and 112 mg/l respectively.

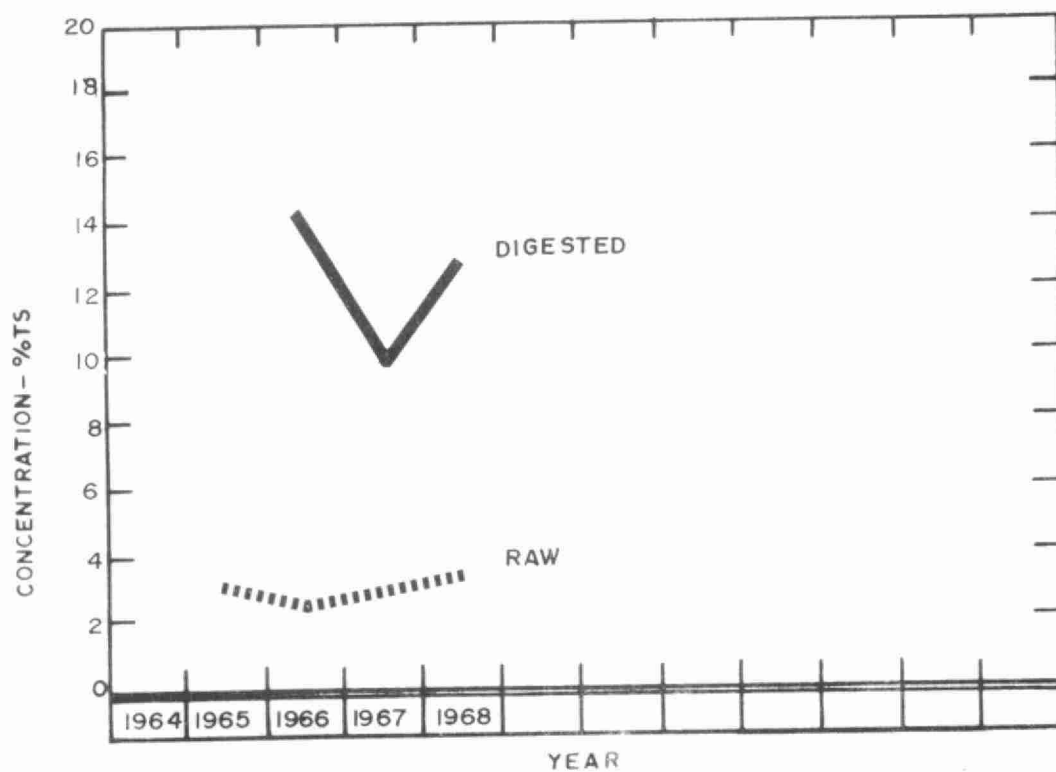
The average effluent BOD and suspended solids concentrations were 51 and 62 mg/l.

The reduction efficiencies were 40% for BOD and 46% for suspended solids.

The average quantity of grit removed per month was 363 cubic feet or 2.1 cubic feet of grit per mg tre: bed.



## DIGESTION



# SLUDGE DIGESTION and DISPOSAL

MONTH	RAW SLUDGE			DIGESTED SLUDGE			SUPERNATANT		SLUDGE DISPOSAL	
	VOLUME 10 <sup>5</sup> gal	T. S. %	V. S. %	VOLUME 10 <sup>4</sup> gal	T. S. %	V. S. %	VOLUME gal	T. S. %	LIQUID yd <sup>3</sup>	DEWATERED yd <sup>3</sup>
JAN	3.89	1.7	-	3.89	.6	-	-	-	231	0
FEB	3.43	2.9	-	3.70	10.4	-	-	-	220	0
MAR	4.67	.7	-	6.12	10.7	-	-	-	363	0
APR	3.88	1.6	-	6.61	6.7	-	-	-	393	0
MAY	13.10	3.5	-	0	10.4	-	-	-	0	0
JUN	5.30	-	-	3.34	-	-	-	-	198	0
JUL	5.16	14.1	24	13.72	17.1	-	-	-	814	0
AUG	4.63	.9	-	9.39	15.9	-	-	-	560	0
SEPT	4.80	3.2	-	8.10	13.6	-	-	-	481	0
OCT	4.73	-	-	5.40	-	-	-	-	320	0
NOV	4.03	3.5	-	9.80	26.7	-	-	-	582	0
DEC	3.62	3.1	76	0	15.5	29	-	-	0	0
TOTAL	61.24	-	-	70.07	-	-	-	-	4162	0
AVERAGE	5.10	3.5	50	5.84	12.8	29	-	-	347	0

## COMMENTS

The concentration of digested sludge for November was 26.7%. This figure is based on a grab sample and could not be considered normal.

The total raw sludge flow for 1968 was 6,124,000 gallons, (510,000 gallons per month) and the quantity of digested sludge was 70,100 gallons per month.

The sludge was thickened in the process from an average of 3.5% T. S. to 12.8% T. S.



## CONCLUSIONS

The 1968 flows increased to an average of 5.75 million gallons per day and exceeded plant capacity 40 percent of the time. This increase, it must be noted, is mostly due to record high storm flows and therefore the raw sewage strength is quite low.

Because of this overloading, the consulting engineering firm of W. L. Wardrop & Associates was retained to study the adequacy of the Brunswick sewage pumping station and related sewers.

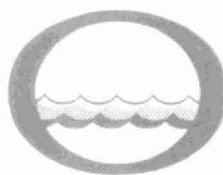
The consultants' recommendations will be examined and it is hoped work will begin in 1969 to modify the storm sewer system. This will relieve the plant from frequent hydraulic overloading.

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